



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

157. Proposed by B.F. FINKEL, A.M., M.Sc., Professor of Mathematics and Physics, Drury College, Springfield, Mo.

January 1, 1899, A and B entered into partnership for 3 years. A put in \$10,000 and B put in \$5,500. July 1, 1899, B put in \$1,500 more. October 1, A took out \$500. January 1, 1900, each put in \$1,500. July 1, 1900, they dissolved partnership, and found that they had lost \$846. What is each partner's share of the loss?

Solution by J. R. HITT, Choral Institute, San Marcos, Texas, and HON. JOSIAH H. DRUMMOND, Portland, Maine.

A has in \$10,000 for 9 months, \$9,500 for 3 months, \$11,000 for 6 months.

B has in \$5,500 for 6 months, \$7,000 for 6 months, \$8,500 for 6 months.

Assuming the loss to be 10% of investment, A's loss would be  $\$750 + \$237.50 + \$550 = \$1537.50$ . B's would be  $\$275 + \$350 + \$425 = \$1050$ .

Hence,  $\$1537.50 + \$1050 : \$846 = \$1537.50 : \$502.696$ , A's loss.

$\$1537.50 + \$1050 : \$846 = \$1050 : \$343.304$ , B's loss.

Also solved by G. B. M. ZERR. Professor Hitt should have received credit for solving 156.

158. Proposed by JAMES F. LAWRENCE, A. B., Professor of Mathematics, Rogers Academy, Rogers, Ark.

My agent sold pork at 5% commission; increasing the proceeds by \$20, I ordered the purchase of flour at 3% commission; after which flour rose 9%, my whole gain was \$40. What did he sell the pork for?

Solution by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics in The Temple College, Philadelphia, Pa.

Let 100% = selling price of pork.

100% + \$20 = total cost.

$(95\% + \$20) \frac{100}{103} = 100 \frac{5}{103}\% + \$21 \frac{1}{103}$ , selling price of flour.

$100 \frac{5}{103}\% + \$21 \frac{1}{103} - 100\% - \$20 = \$40$  gain.

$\therefore \frac{5}{103}\% = \$38 \frac{8}{103}$ .  $\therefore 1\% = \$72 \frac{8}{11}$ .

100% =  $\$7272 \frac{8}{11}$ , selling price of pork.

Also solved by J. R. HITT.

## ALGEBRA.

145. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, Gloucestershire, England.

Factorize  $2b^2c^2 + 2c^2a^2 + 2a^2b^2 + 2a^2d^2 + 2b^2d^2 + 2c^2d^2 - a^4 - b^4 - c^4 - d^4$ .

No correct solution of this problem has been received.

146. Proposed by B. F. YANNEY, Professor of Mathematics, Mount Union College, Alliance, Ohio.

If the series 1, 3, 5, ...,  $2n-1$ , ... be divided into successive groups of  $r$  terms each, the sum of the terms of the  $n$ th group will be  $(2n-1)$  times the sum of the terms of the first group, or  $(2n-1)r^2$ .

Solved by H. S. VANDIVER, Bala, Pa., and E. D. GRABER, Professor of Mathematics, Genesee State Normal School, Genesee, N. Y.

The  $n$  groups in question are

$$\begin{array}{ccc}
1, 3, 5, \dots & 2r-1 \\
2r+1, 2r+3, \dots & 4r-1 \\
4r+1, 4r+3, \dots & 6r-1 \\
\vdots & \vdots \\
2(n-1)r+1, \dots & 2nr-1
\end{array}$$

The sum of the terms in the  $n$ th group is

$$\frac{r}{2}(\text{1st term} + \text{last term}) = \frac{r}{2}(4rn - 2r) = r^2(2n - 1).$$

Solved similarly by *G. B. M. ZERR*, *J. H. DRUMMOND*, and *J. SCHEFFER*.

147. Proposed by *W. J. GREENSTREET*, M. A., Editor of the *Mathematical Gazette*, Stroud, Gloucestershire, England.

Prove that  $x = a^x$  has never more than two real roots, and find the condition for no real roots.

No solution of this problem has been received.

148. Proposed by *R. D. BOHANNAN*, Ph. D., Professor of Mathematics, Ohio State University, Columbus, O.

If  $\frac{x}{a+\alpha} + \frac{y}{b+\beta} + \frac{z}{c+\gamma} = 1$ ,  $\frac{x}{\alpha+\beta} + \frac{y}{b+\beta} + \frac{z}{c+\beta} = 1$ ,  $\frac{x}{a+\gamma} + \frac{y}{b+\gamma}$   
 $+ \frac{z}{c+\gamma} = 1$ , show, without solving, that  $x + y + z = a + \alpha + b + \beta + c + \gamma$ .

No solution of this problem has been received.

149. Proposed by *JOSEPH V. COLLINS*, Ph. D., Stevens Point, Wis.

1. How many different football elevens can be sent out from a school having twenty players? In how many ways can eleven men line up?

Solution by *P. H. PHILBRICK*, C. E., Lake Charles, La.

It is possible to send out  $\frac{20!}{11! 9!}$  elevens, or 167960 elevens.

The eleven men can line up 11! ways.

Also solved by *G. B. M. ZERR* and *C. A. LINDEMANN*.

150. Proposed by *JOSEPH V. COLLINS*, Ph. D., Stevens Point, Wis.

2. How many sets of officers (president, vice-president, treasurer, and secretary) can a society of forty persons elect? How many committees of four persons, supposing no attention is paid to positions on the committees? How many committees in which the chairman is selected?

Solution by *P. H. PHILBRICK*, C. E., Lake Charles, La., and *C. A. LINDEMAN*, Professor of Mathematics Virginia Union University, Richmond, Va.

The society can elect  $\frac{40!}{36! 4!}$  sets of officers.

The number of committees, no attention being paid to positions on the